

Claims

1. A method for ultrasonic welding of parts by means of an ultrasonic welding device including at least a generator, a converter, and a sonotrode, based on a set curve of a time-dependent welding parameter appropriate to a welding connection meeting set requirements, where the welding duration corresponding to the set curve runs between a starting time t_0 and an end time t_e , wherein during welding of the parts an actual curve of the time-dependent parameter is measured, where in the period between t_0 and t_e the actual curve is compared with the set curve and, depending on the existing difference, at least one welding process parameter affecting welding is altered such that an equalization of set curve and actual curve occurs during further welding.
2. The method of claim 1, wherein the set curve is compared with the actual curve at a time t_1 , where $t_0 < t_1 < t_e$.
3. The method of claim 1, wherein the actual curve is compared with the set curve at an identical power value.
4. The method of claim 1, wherein the actual curve is compared with the set curve at an identical energy input measured from the beginning of welding.
5. The method of claim 1, further comprising:
based on a difference between the actual curve and the set curve, altering at least one process parameter of correspondingly stored values.
6. The method of claim 1, wherein at least one welding process parameter is altered gradually over time.
7. The method of claim 1, wherein the actual curve is matched to the set curve by a regulation process.

8. The method of claim 1, wherein the at least one welding process parameter is altered based on comparisons made at various times t_1 , $t_2 \dots t_n$ where $n \geq 2$ between the set values and actual values.

9. The method of claim 8, wherein a regulation of the at least one welding process parameter based on differences between the set curve and actual curve is performed at the times t_1 , $t_2 \dots t_n$ where $n \geq 2$.

10. The method of claim 1, wherein the emitted/received power of the ultrasonic welding device is selected as the time-dependent welding parameter.

11. The method of claim 1, wherein the welding process parameter to be altered includes one or more of: an amplitude of the sonotrode, a frequency of the sonotrode, a pressure acting on the parts to be welded, a force acting on the parts to be welded, and an energy input into the parts to be welded.

12. The method of claim 1, wherein one or more welding process parameters are altered singly.

13. The method of claim 1, wherein one or more welding process parameters are altered jointly.

14. The method of claim 1, wherein welding is regulated over its full duration based on the respective current difference between set curve and actual curve.

15. The method of claim 1, wherein welding is regulated over at least part of its duration based on the respective current difference between set curve and actual curve.